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This report presents a proposed program plan for developing an integrated library network in the State of Washington. The need for such a plan arises from the requirements of Title III of the Library Services and Construction Act and from the increasing demands placed upon libraries and the resulting need to use available resources better. The intent of the program is (1) to promote the increased sharing of resources by libraries, particularly of different kinds and with different area jurisdictions; (2) to use modern technology in an appropriate, economic manner to facilitate the sharing of resources; and (3) to expand the availability of library materials to every resident of the State. Although elements of the program are already in existence, in experimentation, or in discussion, the plan proposed a logical integration of these elements into a single planned progression of steps. Included in this report are a description of the proposed network, the program plan and schedule for implementation, and the specifications of the processing center and switching center. Aspects of the network which are described include geographical area groups, the State Library Card Production Service, specialty groups, a switching center to provide access to major library resources and geographical speciality groups, and technical services. A list of available sources of catalogs and indexes on magnetic tape is appended. (Author/JB)

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UNIVERSITY OF MINN.

WORKING PAPER

FOR

THE WASHINGTON STATE LIBRARY

A PROPOSED LIBRARY NETWORK FOR WASHINGTON STATE

LI001362

JOSEPH BECKER
ROBERT M. HAYES

September 1967

Addendum

The Title III Advisory Council, in session October 27, 1967 approved the concept of The Network Plan as described in this paper. At the same time they wish to correct a misconception on the part of the consultants concerning the status of PNBC. Accordingly, the Council directed that the wording of Item 1, page 42, be corrected to read:

> The University already houses the Pacific Northwest Bibliographical Center...

The Council also cautions the reader to interpret any reference in the paper to "PNBC", in the context of a switching center, as a reference to the "Switching Center" as proposed by the consultants, wherever it may eventually be located.

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I. Introduction and Summary

This report presents a proposed program plan for developing an integrated library network in the State of Washington. While the immediate need for such a plan arises from the specific requirements of Title III of the Library Services and Construction Act, it arises more basically from the increasing demands placed upon libraries and the resulting need to use available resources better.

The intent of the program is three-fold:

(1) To promote the increased sharing of resources by libraries, particularly of different kinds and with different area jurisdictions.

(2) To use modern technology in an appropriate, economic manner and by doing so, to facilitate the sharing of resources.

(3) To expand the availability of library materials to every resident of the State.

The elements of the program plan are already either in existence, in experimentation, or in discussion. The plan, therefore, is neither very new nor very startling. However, the plan proposes a logical integration of these elements into a single planned progression of steps, and thus provides a rationale for development. The program itself is summarized on pages 29,30 Section III (Figure 10 and the accompanying "Time Series of Operational Events", Figure 11).

The following sections present a detailed description of the proposed library network (Section II), of the program plan and schedule for implementation (Section III), of the specifications of the processing center and switching center (Section IV).

Before presenting this detail, however, there are some general remarks to be made concerning the context within which this plan should be viewed. It seems almost superflous to review the number of national developments which now are creating demands for expanded library service -- the State Technical Services Act, the National Library of Medicine program for regional medical libraries, the Office of Education's support of libraries, the joint program of the Library of Congress, the National Library of Medicine, and the National Agricultural Library for development of machine-readable catalog data, etc. These have created not only a new climate for libraries and new support for them, but new resources as well. Therefore, the program plan for Washington State has been designed to articulate with these national programs to the maximum possible extent.

In parallel with these national developments, there have been comparable efforts within the State of Washington. The most significant are the various efforts to produce book catalogs in public library systems (King County Library System, North Central Regional Library, and Timberland Library Demonstration) now increasingly being coordinated through the State Library. The participation

of the State Library in the MARC project is a direct tie-in between the national efforts and those of the State.

Finally, some comments should be made concerning the implications of this program plan:

(1) It implies a degree of "democratization of information", in which all information is made as uniformly available as feasible. In doing so, it is clear that we are not talking about a leveling of resources, however. Rather we are talking about a formal mechanism by which major resources are protected and yet made readily available.

(2) It implies a steady increase in the ability to serve at all points of service. This means the building up of appropriate local collections to meet immediate needs as well as to provide the ability to draw on larger resources.

(3) It implies a cooperative sharing among libraries, independent of their administrative base, be it municipality, school district, industrial concern, or institution of higher learning.

(4) It implies a division of function based upon efficient utilization of the cooperative network, and not upon administrative boundaries. Thus, delivery of materials is made through the most convenient local agency and not through some administrative hierarchy. The channels that deliver material will often not be those that requested it.

(5) It implies an increasing degree of specialization in the collections and interests of individual libraries, so that intellectual and financial resources are not dissipated in duplication of broadly available material.

(6) It implies a sense of responsibility by the individual library to more than its own constituency, including a willingness to serve others and to support the costs of operating larger collections on which it may draw.

(7) It implies an increasing concentration of equipment -- for data processing and communication -- at clearly defined points, thus providing a rationale for installation of specific levels of equipment.

(8) It implies a willingness on the part of libraries to cooperate in a voluntary, but responsible, manner, including a willingness to accept certain common standards of cataloging, collection, and methods of operation.

(9) Finally, but in some ways most importantly, it implies the creation of a new view of the library -- on the part of librarians and users -- as the place to go for information service of all kinds.

II. Proposed Library Network

1. General. The "Library Network" of the State of Washington is constructed from a variety of cooperative groups of individual libraries, through contractual agreements among the libraries to share their resources, and arrangements between the State Library and each group of libraries for certain services. Figure 1 defines terms used in describing this network, and Figure 2 presents a schematic of existing elements from which it is constructed.

As Figure 2 shows, the library network is based on the individual libraries of the state as the primary building block. From them, a variety of cooperative groups are formed through contractual agreements among the libraries and with the State Library. These contracts call for the following commitments from each library participating in a cooperative group:

(1) A commitment to make its collection and services available to the constituency served by other libraries in the group on the same basis of service as provided to its own constituency.

(2) A commitment to maintain an agreed-upon level of service (e.g., book budget, reference staff, etc.).

(3) A commitment to pay for a proportionate share of the costs of a union catalog of the holdings of the group. This proportionate share is to be determined from consideration of both the size of population served and the contribution of resources provided. (i.e., the larger the constituency a library serves,

FIGURE 1

GLOSSARY

TERM	DEFINITION
1. Area	One of twelve areas in the State which are defined by demographic and geographic criteria. The Bowerman Plan for Regional library development divided the State into twelve geographic regions for purposes of library development. Definition of the regions was based on population trends, economic data, and geography. There is no reason why these same regions cannot be built upon as the proposed area groups for network planning.
2. Geographical Area Group	A compact of cooperating libraries within an Area formed by contract to share resources through a common book catalog. Group affiliation within an area offers several benefits to a participating library: 1) it makes a much wider range of resources available to any one library or to any individual in the region; 2) through a common book catalog, it relieves local cataloging burdens, thus releasing professional time for better and increased reader services; 3) economies can be achieved through centralized purchasing and processing and, 4) reduction in duplicate buying makes more money available for the purchase of a greater variety of new materials and other purposes.
3. Group Center	A library formally designated by the Network Plan as the principal focal point for an area or specialty group. A Group Center coordinates title selections for the participating libraries in its area and forwards them to the State Processing Center for acquisition and processing.
4. Information Center	Group center for a specialty group, particularly one which incorporates a high degree of substantive (subject) competence in the specialty.

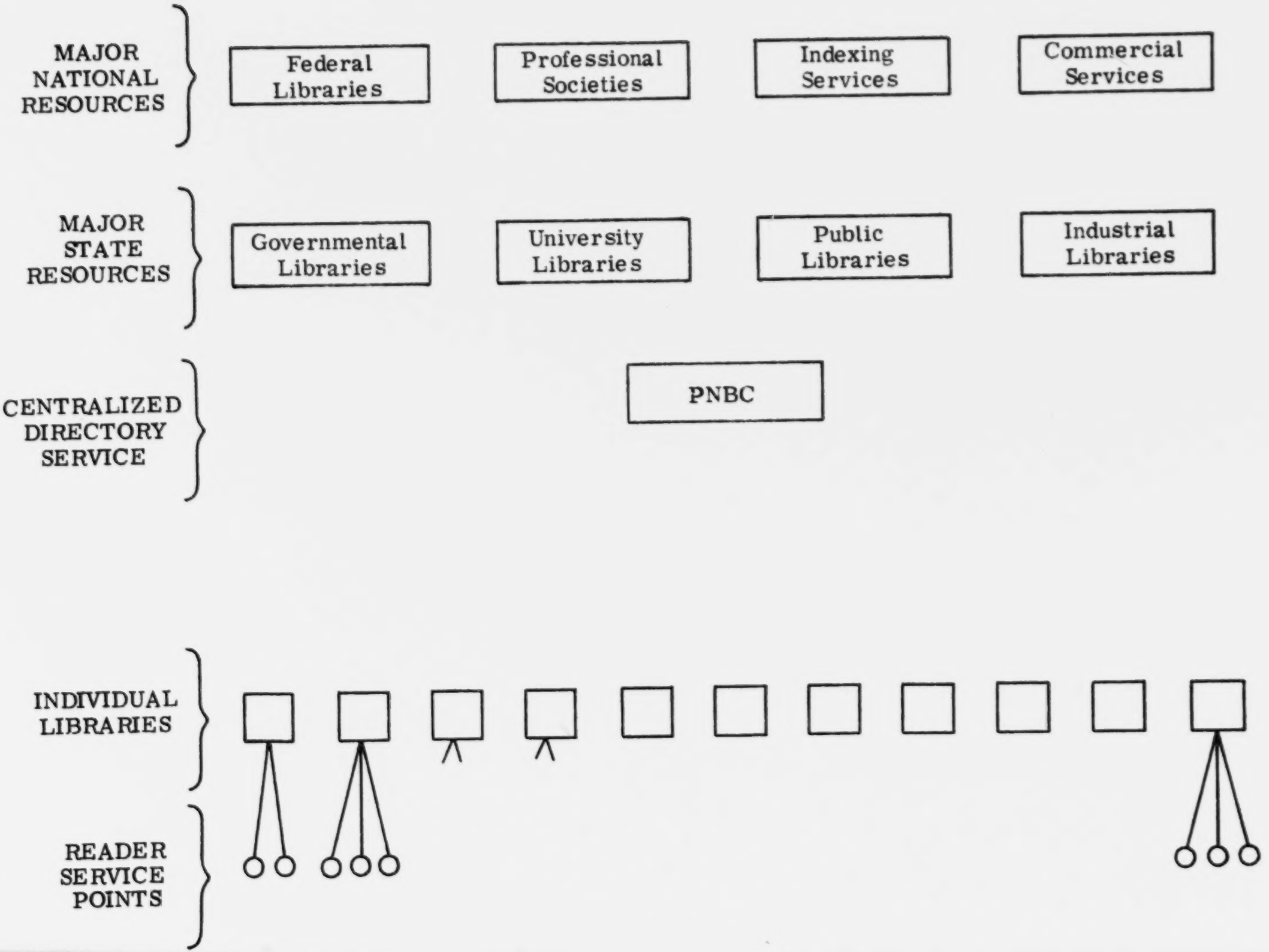
FIGURE 1

GLOSSARY (cont.)

	TERM	DEFINITION
5.	Major National Resources	Those national institutions (including the Federal libraries, professional societies, indexing and abstracting services, commercial services) which are the primary sources of cataloging and indexing data and repositories of original references.
6.	Major State Resources	The largest libraries of the State which, because of the excellence and size of their collections, serve as ultimate reference points.
7.	Processing Center	A State-operated organization for 1) ordering books for groups of libraries, 2) producing and maintaining book catalogs for common use, 3) processing books for library shelving.
8.	Reader Service Point	The point of initial contact in a library for an individual reader request (including branches, bookmobiles, etc.).
9.	Reference Center	Group center for an area group, but particularly one with adequate professional staff and reference resources.
10.	Specialty Group	A compact of cooperating libraries located anywhere in the State whose common subject interests draw them together for the contractual use of specialized resources.
11.	Switching Center	A State-operated organization for referring requests that cannot be satisfied by Group Centers to larger state or national libraries.

FIGURE 2

Schematic of Existing Elements



the larger its proportionate share; the larger the collection it provides, the smaller the contribution it is required to make.

(4) A commitment to contribute to the establishment of a new group reference center, or to the augmentation of an existing strong collection to serve as such a center.

2. Geographical Area Groups. The most evident kinds of groups are those in geographic areas. Twelve of these can be defined, based on Bowerman's "Regional Plan for Library Development" as shown in Figure 3. Although issue may be taken with some details of specific assignment, in general this constitutes a reasonable division by criteria of geography, population, and economy. Area groups are expected to include all types of libraries in the area, including public, school, special, and governmental. This is shown schematically in Figure 4.

In each group, it is expected that at least one "dominant" member will serve as a group "reference center". This may be the primary resource upon which the other libraries in the group draw; it may be the administrative center for the group; or it may be simply the best reference collection. Figure 5 presents the schematic relationship of group centers to their respective areas.

3. Production of Union Catalogs. Since the production of an effective union catalog for the group is an essential element in providing for sharing of resources, the State Library "Catalog Production Service" becomes a primary

FIGURE 3

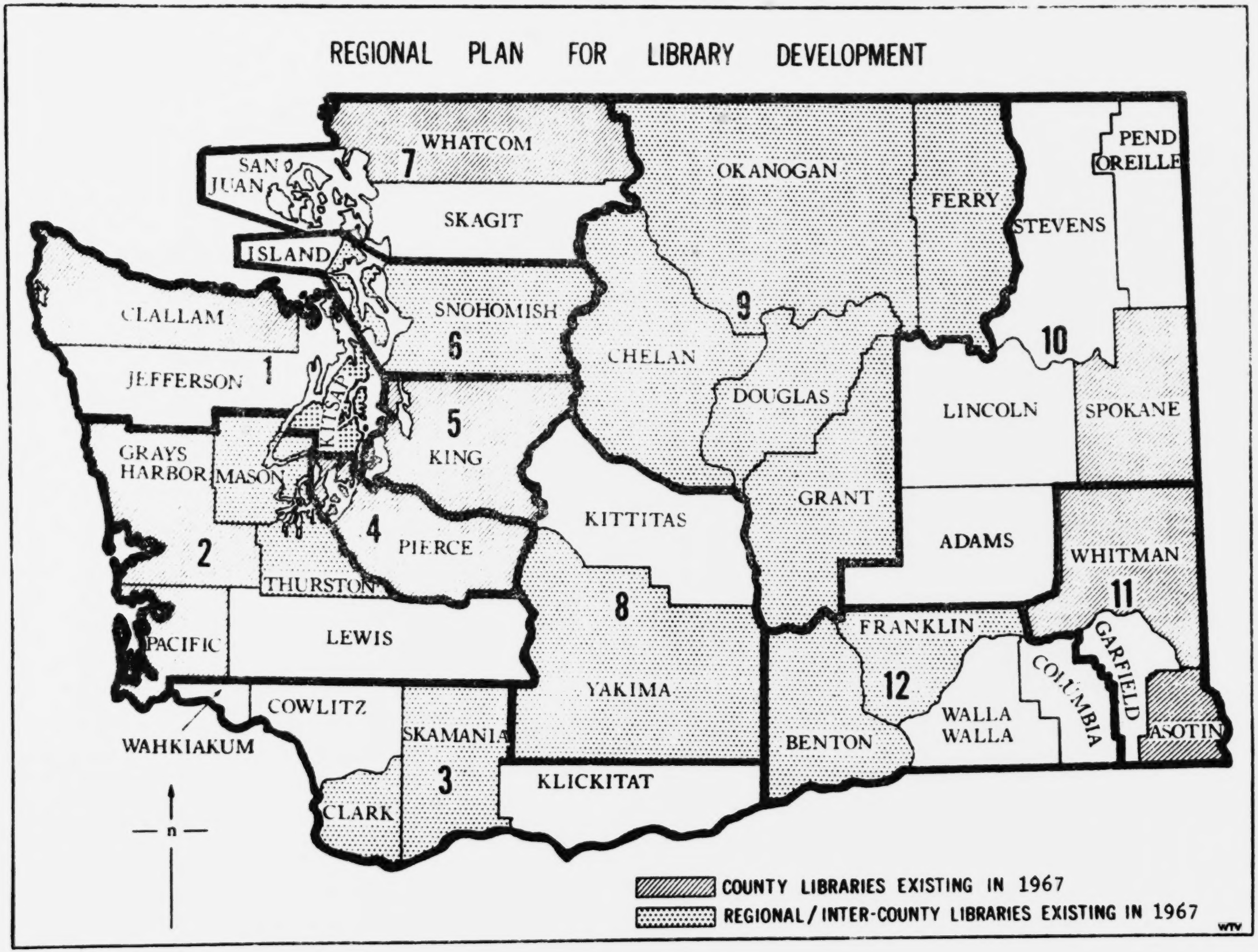

REGIONAL PLAN FOR LIBRARY DEVELOPMENT
WHATCOM
7
SAN JUAN
SKAGIT
ISLAND
SNOHOMISH
6
CLALLAM
JEFFERSON
1
KITSAP
5
KING
GRAYS HARBOR
MASON
4
PIERCE
2
THURSTON
PACIFIC
LEWIS
COWLITZ
WAHKIAKUM
SKAMANIA
3
CLARK
KITTITAS
8
YAKIMA
KLICKITAT
OKANOGAN
FERRY
PEND OREILLE
STEVENS
9
CHELAN
DOUGLAS
GRANT
10
LINCOLN
SPOKANE
ADAMS
WHITMAN
11
FRANKLIN
12
BENTON
WALLA WALLA
COLUMBIA
GARFIELD
ASOTIN
n
COUNTY LIBRARIES EXISTING IN 1967
REGIONAL / INTER-COUNTY LIBRARIES EXISTING IN 1967
WTV

FIGURE 4

Schematic of Geographical Area Groups

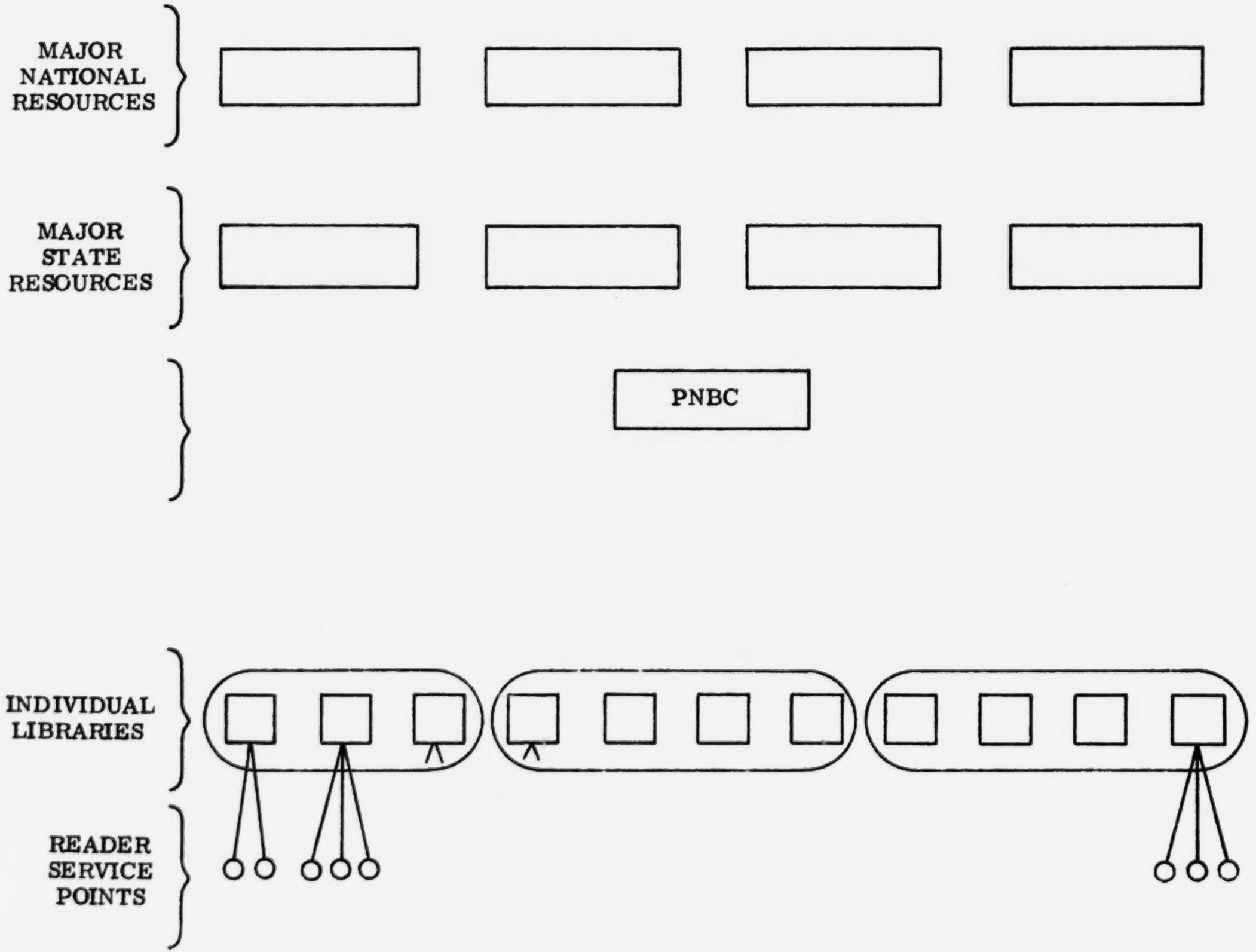
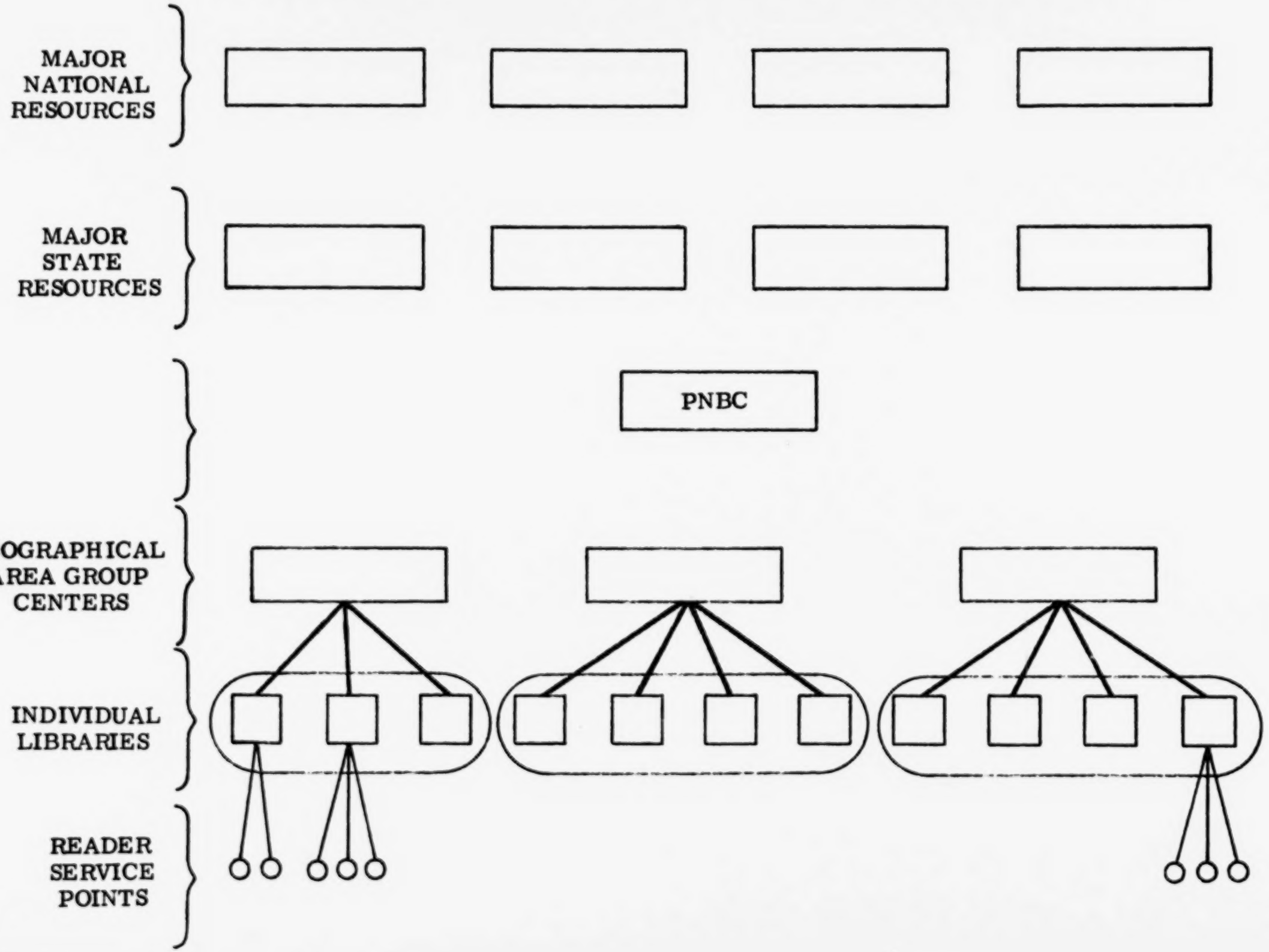


FIGURE 5

The Designation of Geographical Area Group Centers



participant in the establishment of a geographic area group and will contract to produce the catalog of its holdings. The size of the catalog and its frequency of publication are determined by balancing group needs with budgetary issues, primarily determined from the cost of printing an entry. The availability of nationally produced magnetic tapes containing catalog and index data makes the operation of the "Catalog Production Service" economically feasible. Figure 6 therefore presents, in schematic form, the acquisition of these nationally produced magnetic tapes and the production from them of catalogs which are distributed to the libraries and reader service points in each geographic area.

4. Specialty Groups. Another, less evident but equally important, kind of grouping is by specialty. Examples include medicine, law, technology, educational media, etc. Such groups may be formed as a result of requirements for service to specialized constituencies, (such as the medical community) or to perform special services, (such as technical information retrieval). Figure 7 presents a schematic of the creation of specialty groups and specialty centers.

For specialty groups, the group centers can serve much the same purpose as the reference centers serve for the area groups -- i.e., as a primary resource, as an administrative center, as a central reference service. However, for some specialties it may be even more. The concept of an "information center" -- as a place of subject competence, of active research, and of analysis and synthesis of the literature -- is becoming increasingly important. The likelihood is great that

FIGURE 6

Production of Geographical Area Group Catalog

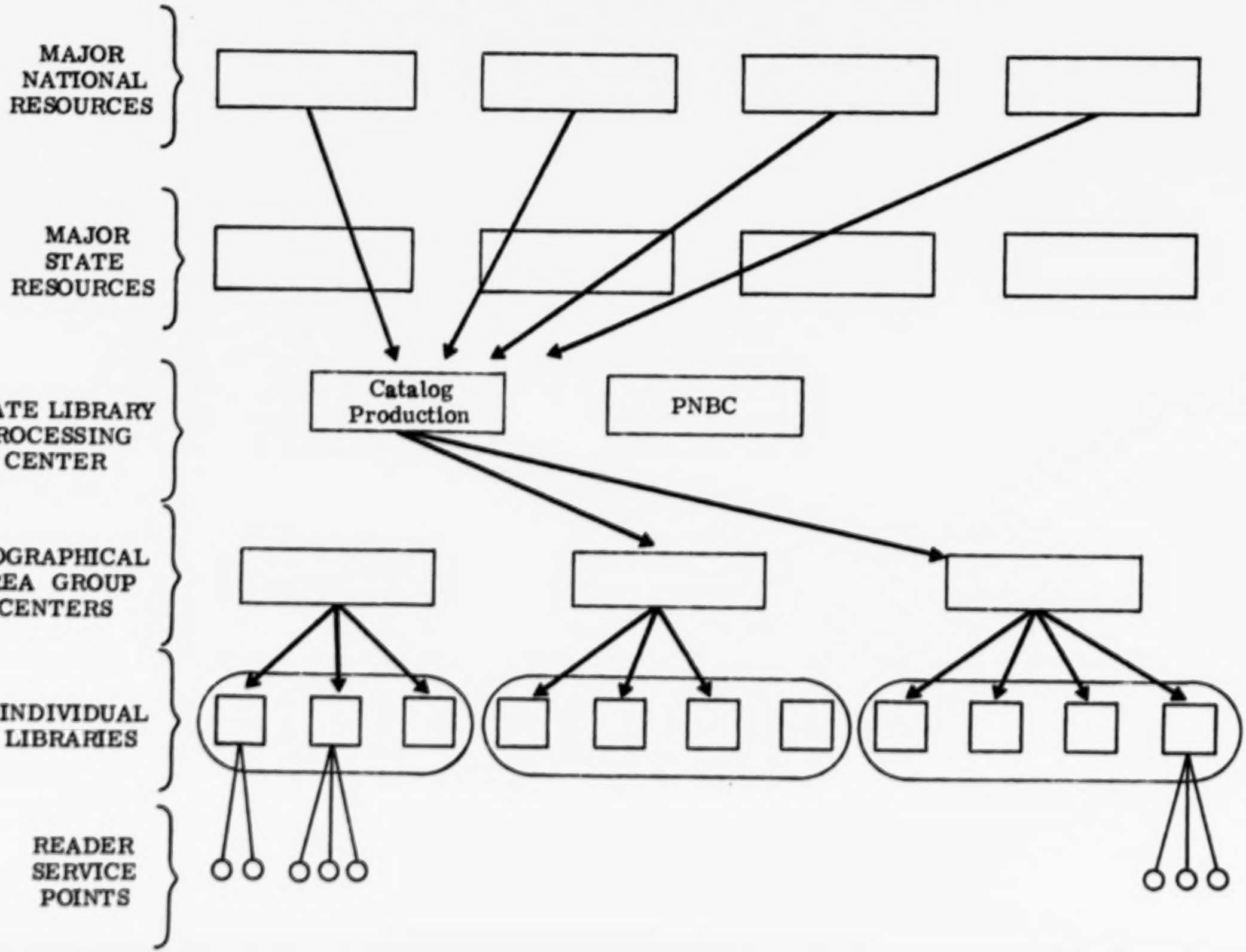
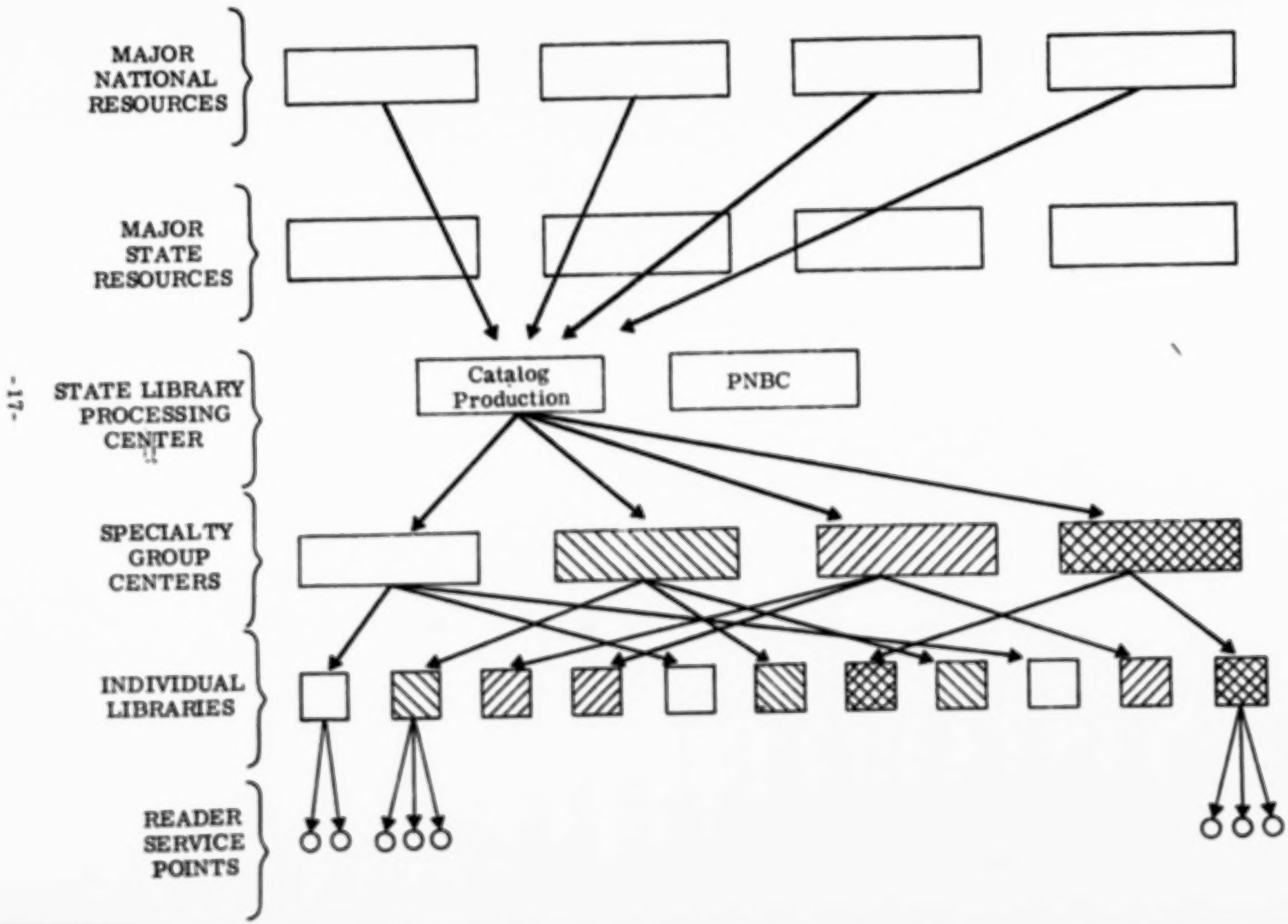


FIGURE 7

Definition of Specialty Group Centers



many of the specialty group centers will be such "information centers" and will be associated with institutions of higher education in the state. In such cases, their catalogs will probably not be a "union catalog", but a catalog of the information center itself, produced by it as part of its research activity.

As Figure 7 shows, it is to be expected that many libraries will participate as members of both an area group and one or more specialty groups. Typically, for example, a school library will be a member of an area group - sharing resources with the public and special libraries in the area - as well as an educational media group - sharing films, slides, etc. among the schools of the state - and perhaps even as part of an educational research group, drawing on the resources of educational research centers and laboratories. Or another example, a hospital library might participate in an area group - usually drawing on the resources of the public library - as well as be a member of a medical specialty group.

5. Switching Center. There are certain Major Resources which participate in the library network in unique ways. Some, such as major industrial libraries, may be essentially outside the network and drawn on only through interlibrary loan cooperation. Others, particularly the universities, will be active participants in such a diversity of ways that they cannot be categorized. For example, for many of the specialty groups, universities will constitute the group reference center or information center. In addition, universities may provide the

primary research collection of the state and, as such, the ultimate resource.

To provide access to these major resources and the geographic and specialty groups, a Switching Center is established, as shown in Figure 8. Separate contractual arrangements are made between the groups and the Switching Center. The Switching Center has catalogs for the holdings of the Major Resources of the State, Nation, and principal groups from which services are available on an inter-library loan basis.

Figure 9 illustrates the operation of a switching center in transmitting a request from a reader at a local service point to state and national resources, followed by the transmission of relevant material back to him. It also illustrates two of the key features of the network as a system:

(1) The request and its answer are transmitted over paths most appropriate to each -- the request through subject competence, the answer through the closest point of reception.

(2) Different communication equipment is used at each level commensurate with the kinds of utilization required.

6. Technical Services. In the proposed network plan, the individual library maintains its own identity and responsibility to its own constituency. In particular, each library remains responsible for selecting and for cataloging to meet its own special needs. However, the benefits gained from cooperative acquisition should impel most groups to establish guide lines for individual library responsibility in

FIGURE 8

Establishment of Switching Center

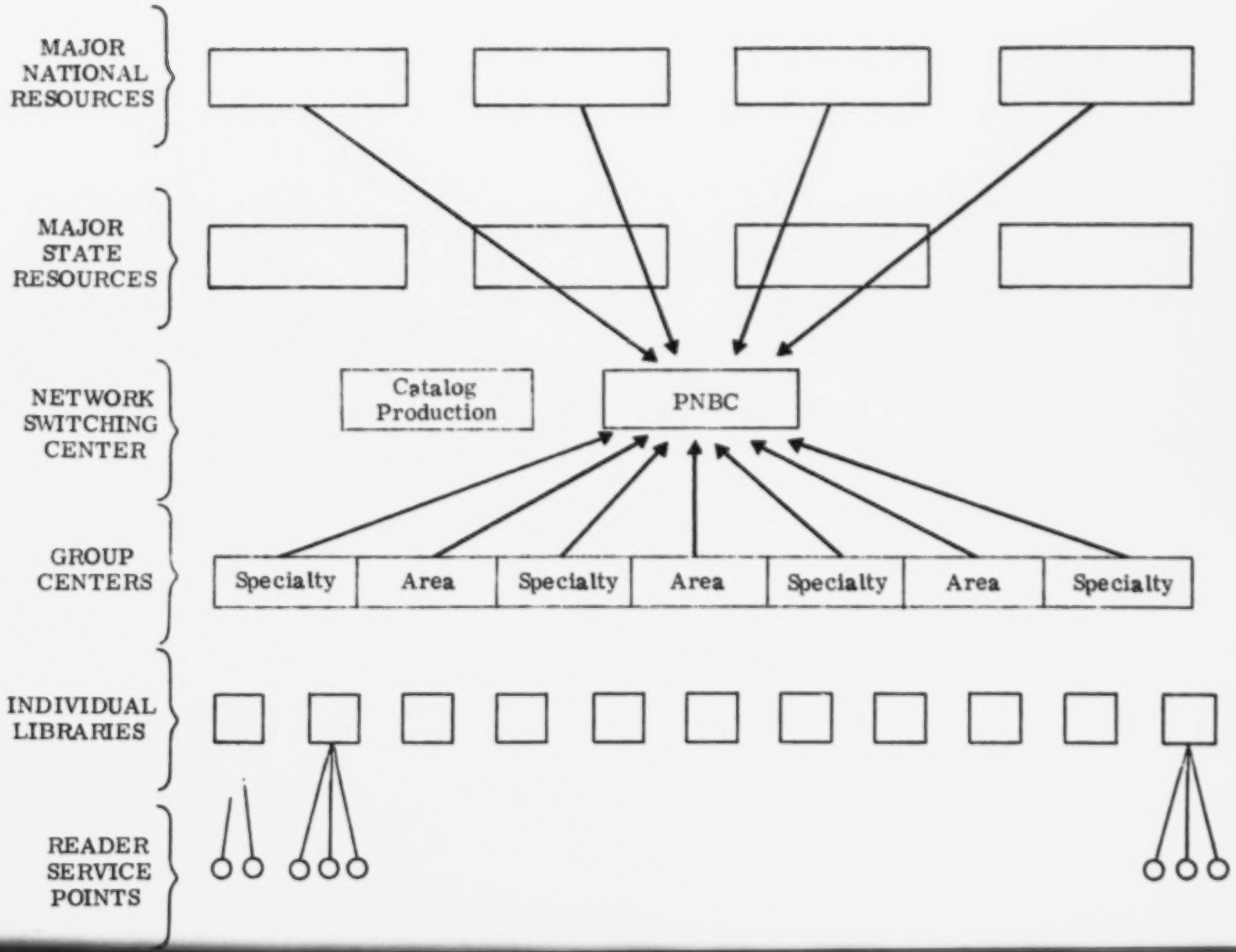
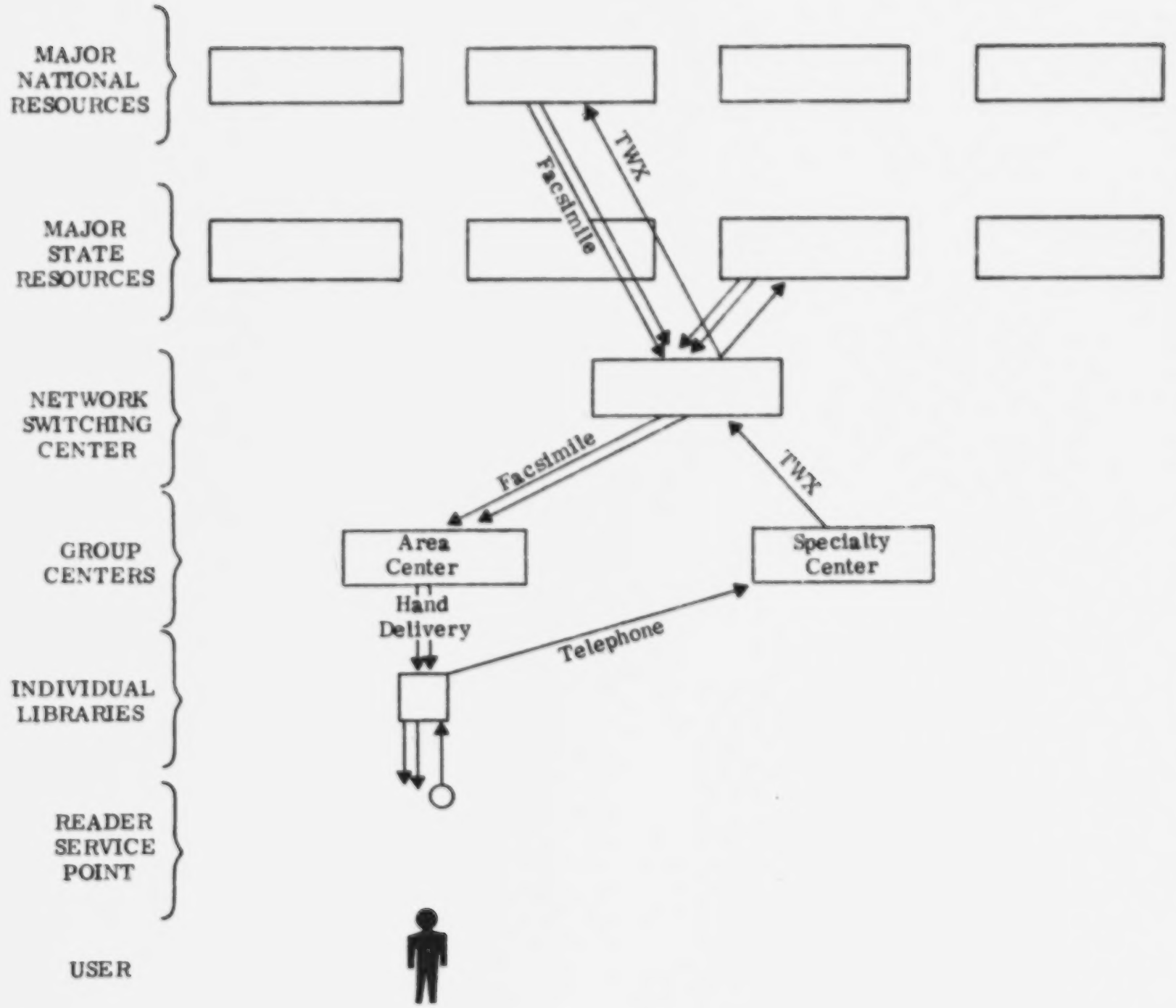


FIGURE 9

Representative Schematic of Request Transmission



specialized areas of acquisition and for combined ordering of more common material.

While the actual ordering, including accounting and in-process control, may be done by the individual library, it can also be done either by the group or under contract by the State Library "Processing Center". Book preparation also may be done by the individual library, the group center, or the State Library Processing Center.

Cataloging will be primarily based on the use of nationally produced catalog data (Library of Congress, NLM, NAL, commercial services), although in certain specialized areas, groups or even libraries may be assigned cataloging responsibilities. This data will be acquired in machine language MARC format form (magnetic tapes) according to established Library of Congress standards.

Book catalogs for the holdings of a group are produced, in standard format and arrangement, by the Catalog Production Service. The frequency of publication, and the number of copies printed, and the number of entries printed are matters of individual arrangement, based on established "costs per entry printed". An individual library, within or outside a group could contract for a catalog of its own holdings in the standard format and arrangement.

When a library becomes a participant in a geographic area group, it must consider the advisability of converting the catalog of its existing collection to the standard magnetic tape format. The group as a whole must also determine the

advisability of doing so and contract with the State Library Catalog Processing Center for the work. Subsequent additions to collections would then be included as a result of the normal catalog production operations. Specifically, identifying data (such as the LC card number) would be sent to the Catalog Production Service for later extraction of relevant bibliographic data from available sources.

III. Program Plan

1. General Context 1967 - 1980

To produce this library network requires the definition of a planned progression of interim systems. Each of them must be operationally viable, each must be technologically and economically feasible, each must be a reasonable extension of the preceding system, and each must be a step toward the achievement of the defined system of 1980. To provide a context for such a planned progression, the following are projected national situations for 1967, 1972, and 1976. In each case, activities will be estimated as either operational, developmental, experimental, or speculative.

The 1967 System. This of course is the present state of affairs.

(a) Operational Activities. All traditional library services are operational. A limited number of mechanized clerical technical processing systems are operational, but only on a limited

basis. Printed book catalogs exist of the holdings of selected library systems. Access to the collections at other libraries by users of one is provided only by the "inter-library loan" procedure and involves an average access time of about a week. Microforms, exist in collections, but do not play a significant role in the services provided.

(b) Development Activities. The creation of a variety of specialized information centers is a major development activity, primarily with funding from Federal agencies. Mechanization of clerical processes is also a major developmental activity.

(c) Experimental Activities. Mechanization of "information services" is an experimental activity in several specialized information centers. The use of more direct methods of circulation from one library to a borrower at another is being experimented with in order to make the practice more widespread. The use of facsimile transmission is an experimental activity.

(d) Speculative Activities. Machine-based information services as a general part of the library are still specu-

lative. The storage of large data bases in direct access memory is still speculative. The use of microform consoles under computer control is still speculative.

The 1972 System. Several activities, both national and local, should reach fruition within this five year period and bring many activities, which were either developmental or experimental, to a stage of operational readiness.

(a) Operational Activities. Most of the clerical and technical processing activities in larger libraries, and many in smaller ones, should be using the computer in a batch mode. Access to the entire collection of a group of libraries will be available by direct call to any library in the group with delivery by mail (or inter-library bus for close libraries). A small number of specialized information centers will be in operation, one or two of which will utilize mechanized data bases as an integral part of their service. The use of nationally produced magnetic tape catalogs and indexes as an aid to general internal library functions will be operational, in a batch mode. Consoles for on-line communication with computers will be in operation but only for computational usage; library clerical usage of them will be at only the most limited level.

(b) Developmental Activities. The on-line use of the computer for clerical and technical service operations will be a developmental activity. The use of nationally produced magnetic tape indexes and catalogs for service to users outside the library will still be in development. Facsimile transmission of library materials will be in development. The large scale, acquisition, production, and use of microform information systems as collateral library material will be a developmental activity.

(c) Experimental Activities. Storage of very large data bases in direct access stores, use of consoles for direct access to library data bases, use of the computer network for transmission of library data bases, and the use of microform consoles operating under computer control will be experimental.

(d) Speculative Activities. The use of the computer for storage and processing of a large amount of text material will still be speculative.

The 1976 System

(a) Operational Activities. Nearly all clerical and technical processing activities in most libraries should be operational in a combination of on-line and batch modes (on-line, for most of the input of circulation, acquisitions, and cataloging data; batch, for most of the processing and bulk output). The use of nationally produced magnetic tape catalogs and indexes will be an integral part of library operations, including acquisition, cataloging, and reference. For recent material and highly active material, the use will be through on-line consoles. An operational computer network for transmission of library data bases will be in operation or nearly so, as will facsimile transmission between libraries over a communications network.

(b) Developmental Activities. The use of consoles for access to data base material from the library; the use of microform consoles, and the production of microforms by the library will be developmental.

(c) Experimental Activities. The storage of very large data bases in direct access stores will be an experimental activity.

(d) Speculative Activities. The storage and processing of text material will still be speculative, including "question answering" and similar sophisticated intellectual processing.

2. Program Plan 1967 - 1980.

Figure 10 presents a summary of the steps to be taken from now until 1980 and Figure 11 presents a time series of events. The dates indicate the time for initiation of each activity, and the time when it will become an operational reality in day-to-day use throughout most of the State.

FIGURE 10

Summary of Program Plan, 1967 - 1980

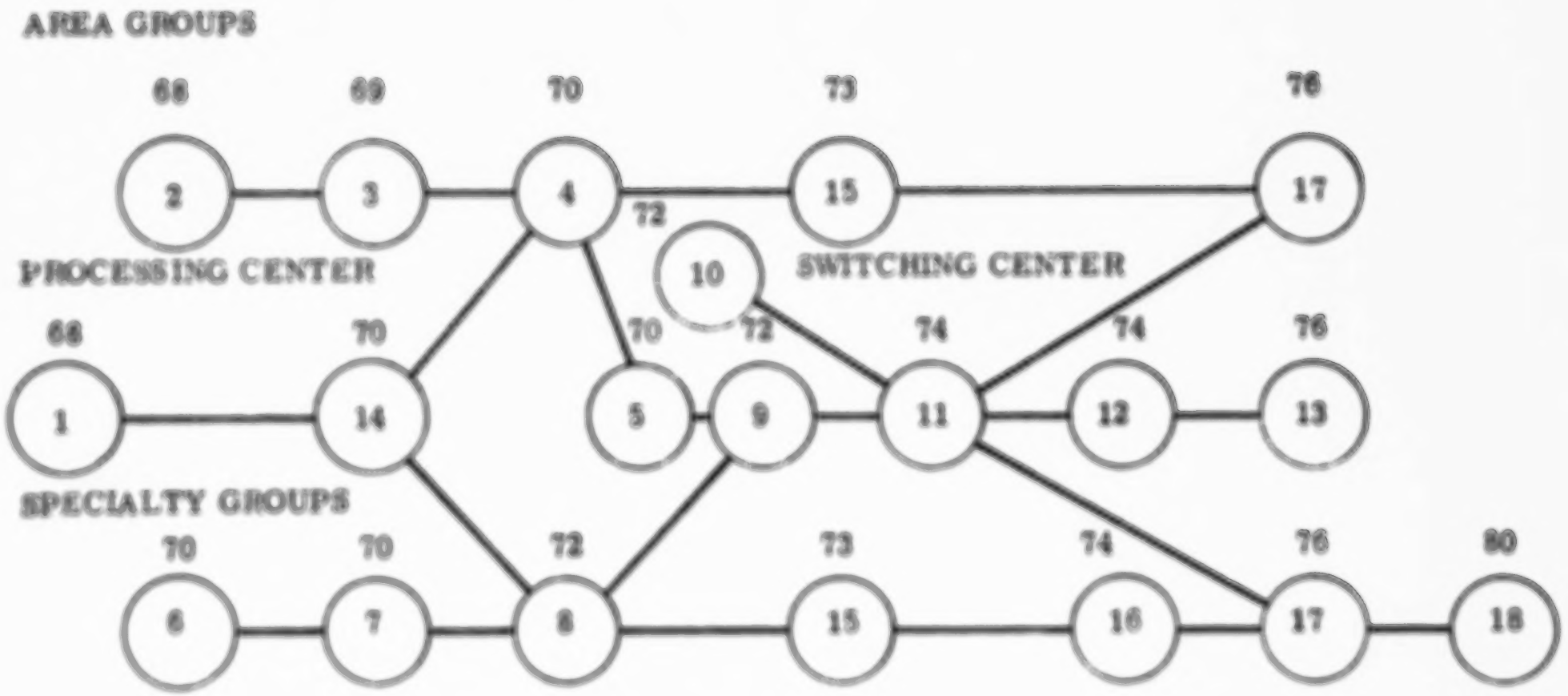
EVENT	DESCRIPTION	DATE STARTED	DATE OPERATIONAL
1.	Establish processing center in State Library, with emphasis on Production of Book Catalogs	1967	1969
2.	Establish geographic area co-operative groups encompassing all libraries in each area	1969	1970
3.	Establish area reference centers in the dominant library of each area	1969	1970
4.	Produce union catalogs for the holdings of each geographical area (excluding major resources)	1970	1971
5.	Collect area catalogs at PNBC, to aid directory services	1968	1970
6.	Establish cooperative groups of libraries providing services in technical specialties	1969	1970
7.	Establish a primary center for each specialty	1969	1970
8.	Produce catalogs (union catalogs or catalogs of primary centers)	1970	1972
9.	Collect specialty catalogs at PNBC to aid directory services	1970	1972
10.	Use state-wide SCAN telephone system for inter-library communication	1968	1969
11.	Establish Automated Switching Center at PNBC, including TWX, store and forward, digital computer communication	1969	1974
12.	Use TWX from group centers to switching center to major resources (state and national)	1970	1974
13.	Provide facsimile from major resources, through switching center, to group centers	1972	1976

FIGURE 10 (cont.)

EVENT	DESCRIPTION	DATE STARTED	DATE OPERATIONAL
14.	Utilize nationally produced machine-readable data at State Library Processing Center	1967	1970
15.	Acquire machine-readable data at group centers for batch internal processing	1970	1973
16.	Provide retrieval services to users of specialty centers (in batch processing mode)	1972	1974
17.	Provide on-line computer services to clerical processing in group centers	1972	1976
18.	Provide on-line computer retrieval services to users of specialty centers	1976	1980

FIGURE 11

Time Series of Events 1967-1980



3. Detailed Schedule for Implementation, 1967 - 1972

The following charts, Figure 12, "Summary of Implementation Plan, 1967 - 1972" and Figure 13, "Time Series of Events, 1967 - 1972", summarize the immediate schedule for implementation. In Figure 12, there are references made to the following notes:

1. Library network office expenses cover Director, staff, consultants, publications, telephone, travel, etc.

2. "Negotiation" costs include travel, telephone, brochures, and displays, etc.

3. Minimal collections are assumed to be about 20 specialized serials with sufficient historical coverage to be generally responsive. The cost is estimated at $600 for each serial[1,2] It is further assumed that, of say 20 libraries participating in the group, five will require investment in the building of minimal collections.

4. MARC tapes are estimated at 6 tapes per year, $50 per tape plus handling expenses for preparation.

5. This effort is already underway at TLD. Costs include programming, checkout, travel for consultation with LC, etc.

---

1. Harvey Mudd Study; A Joint College-Industry Library with Automata, 1964.

2. Bonn, George S. Technical Information for California Business & Industry. A Report to the California State Librarian. Dec. 1966.

6. Key-punching costs are based on the TLD experience of $.25/title for conversion of catalog records. They include all overhead (administration, employee benefits, rent and utilities, etc.) assigned to this work. For each geographical area group and specialty group about 100,000 existing titles should be involved. It is assumed that one area group must be converted in 68/69 and that in later years area groups would benefit from the conversion done by earlier ones. This effort demands that the State Library staff be adequate to monitor and control the work as it is done.

7. Catalog production costs are based roughly on TLD experience of about $.20 per catalog entry printed (in a quantity of 150 to 200 copies), including all overhead (administration, employee benefits, rent and utilities, etc.) assigned to this work. For each area and specialty a base catalog of about 400,000 entries must be printed and then a cumulative supplement each year of about 50,000 entries. It is assumed that in 68/69 one new base catalog (North Central Regional Library) will be produced and that TLD's catalog will be produced in yearly cumulation . In later years, one new area group will be added annually and yearly cumulations produced for all existing ones.

8. It is assumed that specialty tapes will cost about $2,000 each per year.

9. It is assumed that in 70/71 one specialty group base catalog will be produced and that two new ones will be added in 71/72 (with a cumulative supplement for the existing one).

10. SCAN and TWX costs are based purely on installation and monthly charges for terminal equipment and do not include line costs. It is assumed that in 68/69 about 10 TWX installations will be in operation. This covers costs of travel, testing of transmission, etc.

11. This is strictly a guess.

12. This is an estimate based on comparable projects.

13. During 67/68, staff must be hired at the processing center to be capable of starting full-scale operations in 68/69, and particularly to monitor and control the key-punching of catalog data. In subsequent years, the budget for this staff is covered by the costs of catalog production.

FIGURE 12

Summary of Implementation Plan, 1967 - 1972
(Figures in Thousands of Dollars)

NOTES (see pp 32-34)	SEQUENCE OF STEPS	COSTS 67/68	68/69	69/70	70/71	71/72
1.	1. Establish "Library Network Office"	40	40	45	50	55
	2. Establish legal basis for processing in State Library					
	3. Acquire staff at Processing Center	50				
	4. Establish legal and financial basis for area groups to include all types of libraries					
	5. Establish basis for designation of group centers					
	6. Establish basis for affiliation with specialty groups					
	7. Establish relationship with SCAN network					
2.	8. Negotiate with selected areas for demonstration projects to cover all libraries in the area		5	2	2	2
	9. Install SCAN at area centers		2			
2.	10. Negotiate with specialty centers (education, medicine, law, technology, agriculture, etc.)			5	2	2
	11. Install SCAN at specialty centers			2		
2.	12. Negotiate with selected libraries to participate in demonstration projects for specialty groups			10	2	2
3.	13. Establish minimal collections at specialty group libraries			60	120	180
	14. Provide training seminars and work-shops for staff of library groups		10	10	10	10
5.	15. Develop system for standardized catalog production from MARC tapes	10	20	20	10	

FIGURE 12 (cont.)

NOTES	SEQUENCE OF STEPS	COSTS 67/68	68/69	69/70	70/71	71/72
(see pp 32-34) 4.	16. Acquire MARC tapes at State Library		1	1	1	1
	17. Negotiate with area groups to produce book catalogs at State Library					
6.	18. Key-punch necessary catalog data for demonstration geographic area groups		25	25	25	25
7.	19. Produce union catalog for demonstration area groups	10	100	110	120	130
8.	20. Acquire specialty tapes (nationally produced) at State Library (or at specialty centers at major resource)			2	6	12
	21. Negotiate with specialty groups for production of book catalogs					
6.	22. Key-punch necessary catalog data for specialty demonstration groups			25	50	75
	23. Acquire staff at Switching Center	25	50	50		
9.	24. Produce catalogs of specialty centers and distribute to specialty demonstration groups				100	210
	25. Acquire Group catalogs at PNBC					
	26. Establish legal basis for PNBC to serve as switching center					
10.	27. Experiment with SCAN usage by libraries to PNBC				2	10
9.	28. Install TWX in PNBC and in major resources as demonstration				15	25
10.	29. Negotiate with national sources for TWX service				2	2
11.	30. Install experimental "store and forward" at PNBC					75

FIGURE 12 (cont.)

NOTES	SEQUENCE OF STEPS	COSTS 67/68	68/69	69/70	70/71	71/72
(See pp 32-34)						
11.	31. Install experimental facsimile equipment at PNBC and major resources					150
	32. Provide specialized training for library systems analysts at Group Centers				20	20
4,8.	33. Acquire machine-readable data at group centers				4	6
12.	34. Develop batch clerical processing programs and procedures for group centers			10	20	30
	TOTALS	70	203	352	611	1072

FIGURE 13

Time Series of Events 1967-1972

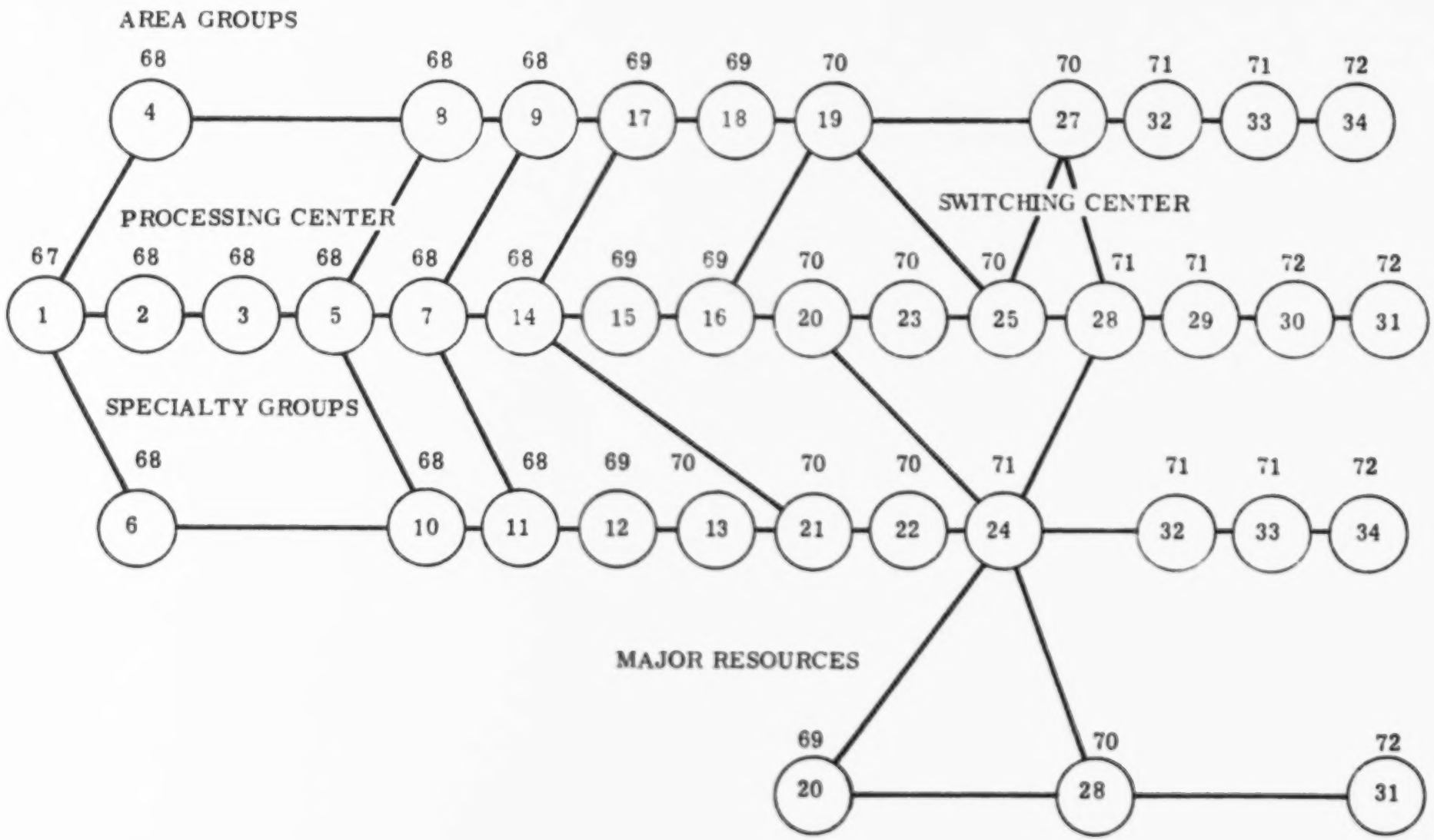


FIGURE 14 Fiscal Period Activities, 1967 - 1972

Beg. fiscal period				
67/68	ESTABLISH LIBRARY NETWORK OFFICE			
	CATALOGS	AREA GROUPS	SPECIALTY GROUPS	COMMUNICATIONS
	Establish legal basis for Processing Center (if required). (1969 if legislation required)	Establish criteria for designation of area centers.	Establish criteria for designation of primary specialty centers. Establish basis for affiliation with specialty centers (education, medicine, law, technology, agriculture).	
68/59	Establish Processing Center in State Library. Acquire MARC tapes at State Library. Develop system for standardized catalog production from MARC tapes. (67-69)			Install statewide telephone system, SCAN, for interlibrary communication. Establish legal basis for PNBC to serve as switching center. (1968)
69/70	Negotiate with area groups to produce catalogs at State Library. Keypunch necessary catalog data for demonstration area groups. Acquire specialty tapes (nationally produced) at State Library (or at specialty centers at major resources). Negotiate with specialty groups for production of book catalogs.	Establish legal and financial basis for area groups to include all libraries. Negotiate with selected areas for demonstration projects to cover all libraries in the area. Establish geographic cooperative groups encompassing all libraries in each area. Establish area reference centers in the dominant library of each area.	Negotiate with selected libraries to participate in demonstration projects for specialty groups. Acquire resources in specialty group libraries. Establish cooperative groups of libraries providing services in technical specialties. Establish primary center for each specialty.	Install TWX in PNBC and in major resources as demonstration. Negotiate with national sources for TWX service. 1969 Begin to establish center (in PNBC) including TWX. Store and forward, digital computer communication. (1969-1974)

FIGURE 14 (cont.)

Beg. fisca. period	ESTABLISH LIBRARY NETWORK OFFICE			
	CATALOGS	AREA GROUPS	SPECIALTY GROUPS	COMMUNICATIONS
70/71	Keypunch necessary catalog data for specialty demonstration groups. Produce union catalog for demonstration area groups. (1970)	Acquire machine-readable data at group centers for batch internal processing. (1970-1973)		Use TWX from group centers to switching center to major resources, state and national. (1970-1974) Install experimental "store and forward" at PNBC. (1969 or 1970)
71/72	Produce catalogs of specialty centers and distribute to specialty demonstration groups. Produce union catalogs for the holdings of each geographical area (excluding major resources). (1970)			
72/73	Produce catalogs (union catalogs or catalogs of primary centers) of each specialty. (1970-1972)	Begin development of on-line computer services to satisfy a wide variety of processing needs in group centers, e.g., circulation control, serial records control, etc.	Begin development of retrieval services (use of tapes for searching bibliographic information) to users of specialty centers (in batch processing mode). (1972-1974)	Install experimental facsimile equipment at PNBC and major resources. (1972) Provide facsimile from major resources, through switching center, to group centers. (1972-1976)

IV. Specifications on Processing Center and Switching Center

1. General. In the operation of the proposed network, the Processing Center and the Switching Center play predominant roles. The Processing Center serves first as a means of producing book catalogs for the participating groups economically and efficiently, and second as a means of providing contract services in other areas of technical processing. The Switching Center serves first as a communications center for receiving and transmitting library data, and second as a directory service.

The program plan calls for the Processing Center to be an administrative part of the State Library. There are several reasons for this choice:

(1) The State Library has gained a large amount of experience and a high level of competence for this work as a result of their production of catalogs for the Timberland Library Demonstration project.

(2) The State Library is already receiving Library of Congress MARC tapes and gaining experience with their use.

(3) The State Library has established working relationships with the computing facilities available from State agencies in Olympia.

(4) The State Library has played a key role in the functioning of the Library Services and Construction Act and is in the best position to serve all types of libraries.

The program plan calls for the Switching Center to be an administrative part of the University of Washington. There are also several reasons for this choice:

(1) The University already ~~administers~~ houses the Pacific Northwest Bibliographic Center which provides the directory services of a Switching Center.

(2) The University will almost certainly administer a large number of the Specialty Group "information centers" and thus will represent a natural focal point for much of the communication traffic.

(3) The University is a member of EDUCOM, the inter-university Communications Council, and as such will be a point of entry into the national computer-based information network.

(4) The University has the resources -- library, computers, academic staff -- necessary to the switching center to function efficiently.

2. <u>The Processing Center.</u> The Processing Center in the State Library would be established to provide three basic sets of technical services:

(1) Production of Book Catalogs for participating groups of libraries;

(2) Centralized, consolidated book ordering for contracting groups;

(3) Book preparation for contracting groups.

internally, the Processing Center should be organized into three divisions, each with responsibility for one of these functions.

In the operation of the Processing Center, mechanization plays a key role. The Center will acquire catalog and index data from national sources in magnetic tape form. Some of the presently available sources serving both general purpose needs and specialty needs are listed in a Supplement to this report. The Processing Center will also supervise the key-punching (or typing) required for conversion of catalog data on existing collections of participating groups. The production of the book catalogs will utilize computer techniques for extracting relevant data from magnetic tape, sorting and arranging it in required standard filing order, and producing print masters. The production of book cards, labels, and other output to aid in book preparation can also be included as part of the computer operation.

Because of the variety of magnetic tape data bases involved, there are some real technical problems which can arise in the development of the Processing Center. However, two points are significant:

(1) The Library of Congress MARC project is becoming of focal importance and creating a standard of format to which other producers of cataloging data are likely to conform.

(2) The development of "general purpose programs", capable of handling the variety of magnetic tape formats involved in the operation of the Processing Center is a major effort now underway.

The Processing Center must be operated on a well-controlled financial basis; including a system of cost-accounting which establishes a valid basis for pricing individual services. Specifically:

(1) An appropriate "Chart of Accounts" must be established to cover all sources of cost in the Center's operation, including personnel, equipment, and overhead.

(2) Appropriate Units of Work must be established to measure the amount of service provided under each type of service (The "volume", so common in library statistics, is completely inadequate to measure the publication of a book catalog or the ordering of a title).

(3) Adequate cost reporting procedures must be developed as an integral part of the operations of the Center, and the reports produced should reflect the total costs of operation -- per unit of service provided -- with proper allocation of overhead.

3. The Switching Center. The Switching Center performs three basic functions:

(1) It provides a Directory Service by which it can assist in determining likely sources of data in response to requests.

(2) It provides a Communications focal point, at which economic levels of equipment can be placed and utilized with relatively high-volume traffic.

(3) It provides a Switching service, which will send messages and data to the proper service points.

In the operation of the Switching Center, mechanization plays a crucial role, with equipment included to support each of the functions of the center. Specifically:

(1) The Switching Center eventually should have access to an on-line computer system which can store and retrieve the directory information of high-frequency use. This kind of information retrieval function is well-proven and economic.

(2) The Switching Center should include equipment for high-speed data transmission -- facsimile, computer to computer, large-volume data -- plus equipment for storing and accumulating low-speed data for subsequent forwarding at high speed.

(3) The Switching Center should include the ability to store identifying data, defining the source and destination of all messages and data handled, for control and switching of the transmission.

In addition to these service functions, the Switching Center should also include a monitoring function which will maintain statistics on network utilization and traffic flow.

SUPPLEMENT

Available Sources of Catalogs and Indexes on Magnetic Tape

American Bibliographical Center
800 Micheltorena Avenue
Santa Barbara, California 93108
Dr. Eric Boehm, Director (805) 962-6582
Mechanized production of the five year index for Hist.Abstracts, containing all bibliographic elements exclusive of the abstracts themselves.

American Chemical Society
1155 16th Street, N.W.
Washington, D.C.
(202) RE 7-3337
Joseph Kuney, Director of Publications Research
Steve Walcavich, Programmer in Charge
Began in 1966 to produce Journal of Chemical Documentation by computer-driven Photon 200. About 100 articles for 1966; 500-600 expected by end of 1968. Also putting some of the articles in the Journal of Chemical Engineering Data for 1966 in machineable form. Goal is to produce all of ACS journals in this way, possibly by 1968.

American Institute of Physics
335 East 45th Street
New York, New York 10017
(212) MU 5-1940
They are working on a thesaurus in magnetic tape format as the first step toward mechanization.

American Petroleum Institute - Division of Refining
Central Abstracting and Indexing Service
555 Madison Avenue
New York, New York 10022
Mr. Everett H. Brenner, Manager
Currently abstracting 1,000 documents and journal articles, and 1,000 patents per month, and storing on magnetic tape.

SUPPLEMENT (cont.)

American Society for Metals
ASM Documentation Service
Metals Park, Ohio 44073
Mrs. Marjorie Hyslop, Assoc. Director
(216) 338-5151
Literature in the field of Metallurgy, stored on magnetic tape.

Applied Mechanics Review
Southwest Research Institute
8500 Culebra Road
San Antonio, Texas
Mr. Stephen Juhasz (572) 684-2000
Complete data on magnetic tape for the WADEX (word and author index) system -- actually a series of programs and data to create the index to AMR.

Atomic Energy Commission
Germantown, Pennsylvania
John Sherrod, Asst. Director of Information
(202) 973-4371
Two sets of magnetic tapes currently produced: 1) Used in production of Nuclear Sciences Abstracts; 2) A general type used in SDI programs.

BioScience Information Service
3815 Walnut Street
Philadelphia, Pennsylvania 19104
(215) 386-0414
Phyllis V. Parkins, Director
Miss Louise Shultz, Asst. Director of Systems Development
Mechanized system is used for producing Biological Abstracts and its three indexes:
1. Author
2. Permuted fragments from an augmented title listing
3. Coordinate Posted Index - a precoordinate index, using only the terms which are used as headings and subheadings of BA sections. These then are large terms rather than detailed specific uniterms.

SUPPLEMENT (cont.)

R.R. Bowker Company
1180 Avenue of the Americas
New York, New York 10036
(212) LT 1-8800
Mr. John Berry, III

Has automated the production of Publishers Weekly, BPR, etc. and wishes to encourage general use of tapes (Wish to market own tapes eventually). They have more than one data bank available to any interested subscriber.

Chemical Abstracts Service (CAS)
2540 Olentangy River Road
Columbus, Ohio 43202
Mr. Elden G. Johnson, Manager; Subscriber Information Service
(614) 293-7423
293-5022

1. Chemical Abstracts (CA) are not yet automated in any way, except for indexes of some issues being on tape. Hope to have CA produced by computer-driven Photon by 1969.
2. Chemical Titles began in 1962. This is a KWIC-type index with about 500,000 titles.
3. Chemical Biological Activities began in 1964 and now has about 21,000 titles with abstracts

CAS has a registry system which takes two-dimensional drawings representing compounds and searches for those containing the same structure, no matter how displayed. Now have 500,000 compounds, with a capacity of 5 million.

Clearinghouse for Federal Scientific & Technical Information
5825 Port Royal Road
Springfield, Virginia 22151
Bernard Fry, Director
Peter F. Urback; Asst. Director, Systems
(703) 321-8500

Embarked on the production of consolidated indexes for Federal STI (NASA, AEC and DOD) using computers.

SUPPLEMENT (cont.)

Institute for Scientific Information
325 Chestnut Street
Philadelphia, Pennsylvania 19106
(215) WA 3-3300
Dr. Eugene Garfield, Director
Dr. Irving H. Sher, Director of Research
Tapes available on lease or buy arrangement. File of Science Citation Index, ASCA, and ISI Search Service.

Library of Congress
First and Capitol Streets
Washington, D.C. 20541
(202) 783-0450
Mrs. Barbara Markuson
Project MARC is an experimental, but continuing, effort to provide primary cataloging data in magnetic tape form. Presently limited in distribution to 16 participating libraries.

NASA (by contract with Documentation, Inc.)
4833 Rugby Avenue
Bethesda, Maryland 20014
Mr. Herbert White (in charge of NASA-STAR program).
(202) 696-9500
NASA-STAR is produced using magnetic tape. Now developing an on-line service. Establishing sub-centers at several universities.

National Standard Reference Data Systems
Gaithersburg, Maryland 20760
Dr. Steven Brady, Director
(202) 921-1000
Indexed bibliographies and data in magnetic tape form. Bibliographies run to 30,000 references with notes on data content.

SUPPLEMENT (cont.)

National Library of Medicine
8600 Rockville Pike
Bethesda, Maryland 20014
(202) 656-4084
Bethesda Office (301) 654-9190

Has been producing Index Medicus for several years using mechanized methods and is servicing requests for searching of the existing files. Establishing sub-centers throughout the world.

Office of Education
400 Maryland Avenue, S.W.
Washington, D.C. 20202

Project ERIC (Educational Research Information Center) is proceeding to place citations and abstracts on magnetic tape.

Scientific Information Exchange
Smithsonian Institution
Madison National Bank Building, Suite 300
1730 M Street, N.W.
Washington, D.C. 20036
Dr. Vincent Maturi, Chief, Physical Sciences Division
Monroe E. Freeman, Director

Magnetic tape files include descriptions of grant-supported research projects and an inverted subject index to them.